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OFFICE OF THE SECRETARY

July 22, 1998

EX-100-1000 DATE FILED

**SECRET**

Re: Notification of *Ex Parte* Contact in CC Docket No. 94-102

On Monday July 20, 1998, Motorola and its representatives met with members of the Wireless Telecommunications Bureau to discuss key issues concerning Docket No. CC 94-102. Representing Motorola was Mary Brooner, Katie Branding, John Kalenowsky, Emil Vogel, Bilal Saleh, Mark Birchler, and Tom Dombrowsky of Wiley, Rein & Fielding. The Wireless Bureau was represented by John Cimko and Nancy Boocker.

The purpose of the discussions was to ensure that the E911 policy decisions were based upon an understanding that there are differences inherent in the varying digital and analog technologies used for commercial mobile services that dictate unique results in meeting the Commission's E911 requirements. Additionally, accuracy compliance and legacy phone issues were also discussed.

A handout was provided that has been included as an attachment hereto. Should any questions arise concerning this *ex parte* notification, please contact the undersigned or Thomas Dombrowsky at (202) 429-7236.

Wm. H. Miller

Enclosures: Presentation  
cc (w/encl.): John Cimko  
Nancy Boocker

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# **E911 Location Technology and Regulatory Issues**



## Agenda

- **Accuracy Compliance**
- **Network vs. Handset Solutions**
- **Legacy Phone Issues**
- **Industry Activities**
- **Recommendations**

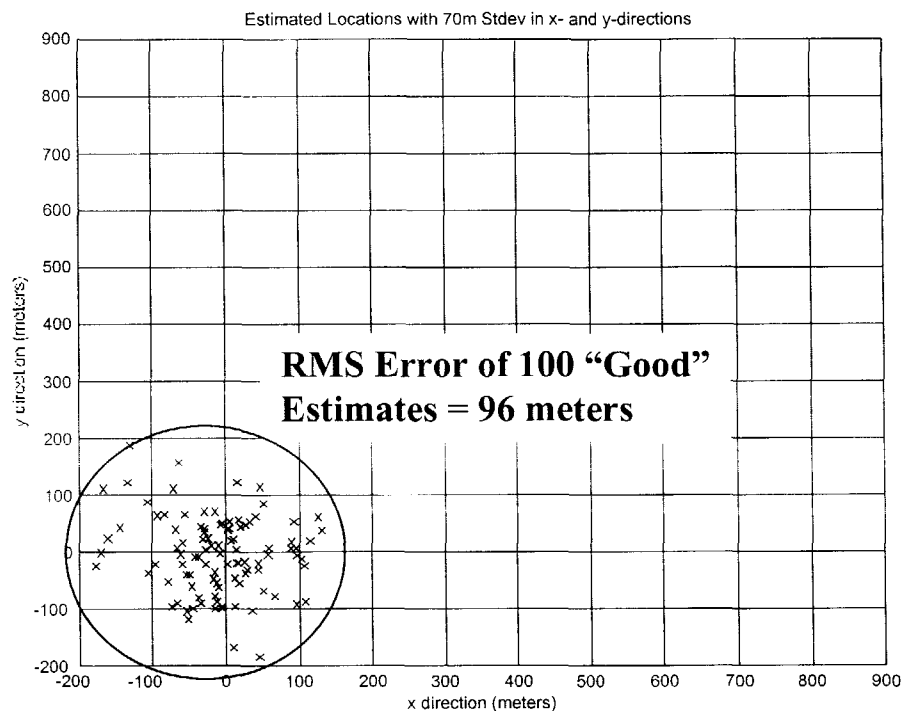
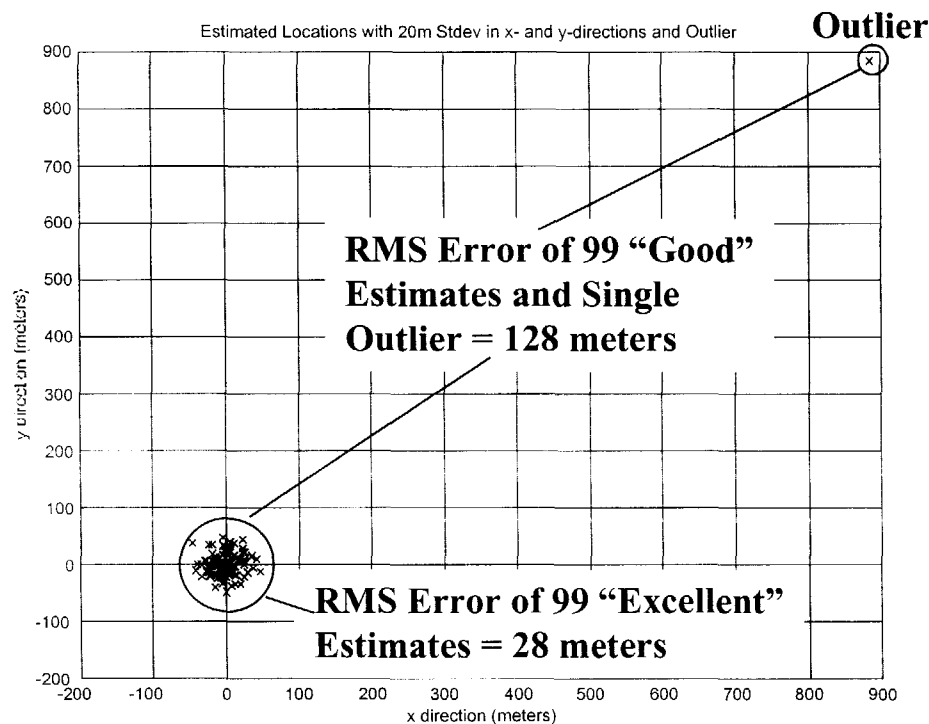
## Accuracy Compliance

- **RMS accuracy measurement definition threatens ability of industry to comply**
  - Motorola supports Ericsson's analysis of the issue
  - RMS decision based on limited first generation data
    - Assumption that errors are essentially Gaussian distributed
    - Single manufacturer (Associated Group)
    - Total test area only "tens of square miles" (the Chicago metro area occupies approximately 1,000 square miles)
    - Full descriptions of test environments and data processing techniques not provided
- **Definition of compliance**
  - Accuracy is a function of operating environment (e.g., suburban, urban, mountainous)
  - Overall accuracy is a function of E911 call distribution



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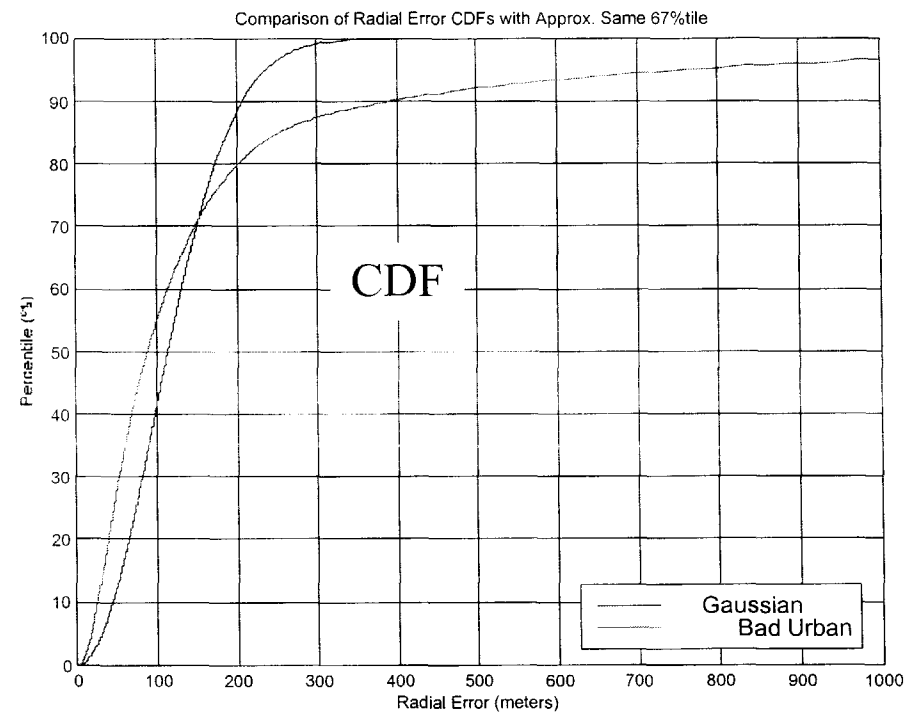
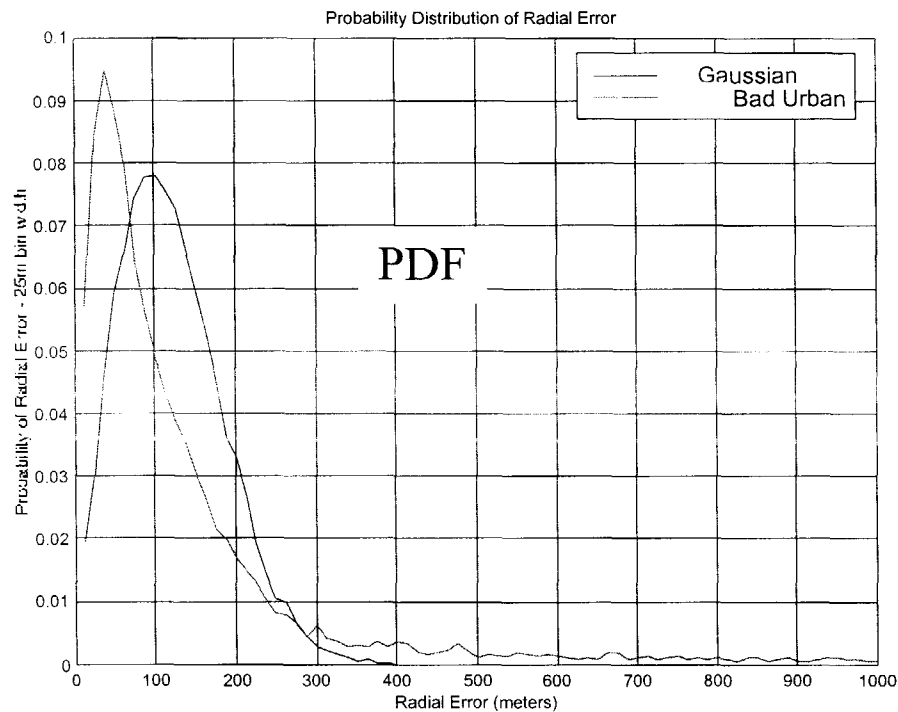
## RMS Accuracy Measurement Problem



- **A Single Outlier Can Cause an Otherwise Excellent Accuracy System to Fall Out of Compliance**

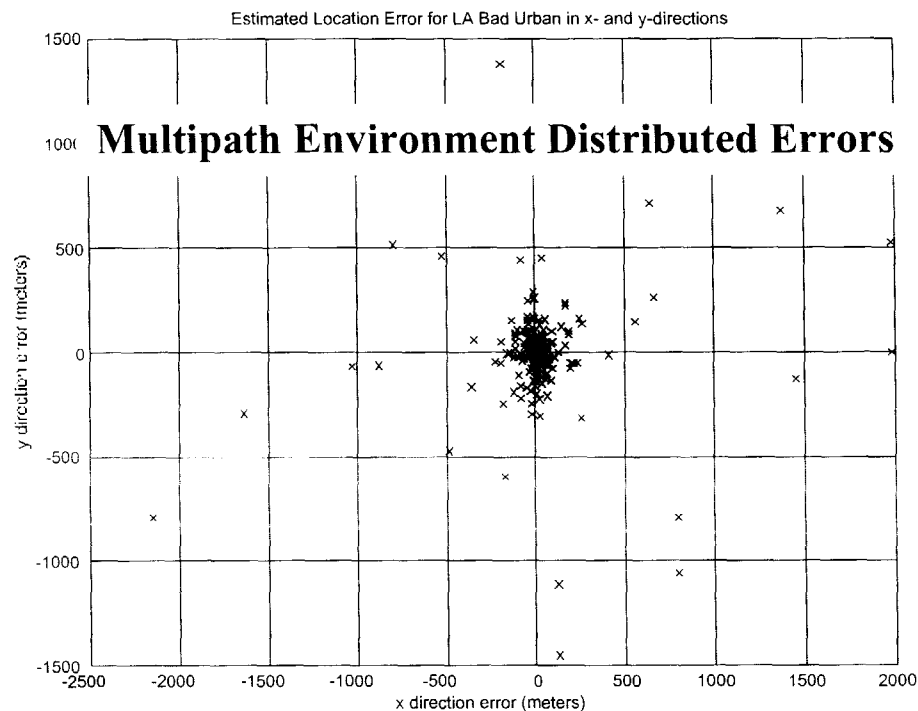
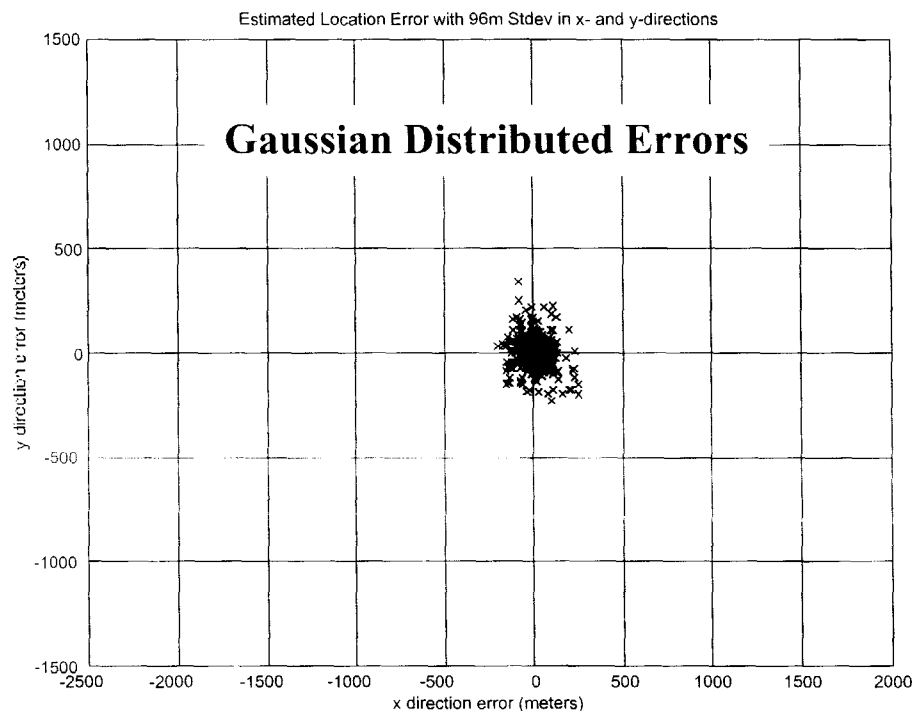
## Location Error Distributions

- **Location errors in multipath environments are not Gaussian distributed**



- **Both distributions have similar 67% error values**
- **The multipath distribution has a much more pronounced “tail”**

# Location Error Scatter Plots



- Scatter plots of error data underlying PDFs and CDFs from previous chart

## Compliance Activity

- **Compliance issues under study by WEIAD**
  - Goal to develop a consensus agreement on compliance measurement which includes all interested parties
  - October completion target
- **Two compliance definitions being studied**
  - 125 meter, for 67% of E911 calls
  - 125 meter, RMS calculation on best 90% of E911 calls
- **Both definitions are acceptable to Motorola in terms of LOCATION ACCURACY compliance**
  - Motorola will assist in the evaluation of these options
  - Both options effectively deal with the “outlier” problem
- **Neither definition addresses the LEGACY HANDSET issue**



## Network vs. Handset Solutions

- **Handset Solution**

- Industry Standards required:
  - Support of Roamers
  - Required functionality in all new handset
- Penetration of location compliant units depends on wireless provider's:
  - Market entry date
  - Size of Existing base
  - Amount of churn
- Similar issues across all RF technologies

- **Network Solution**

- Industry Standards required:
  - CDMA, GSM - Yes
  - AMPS, iDEN - No
- Penetration of location compliant units depends on:
  - CDMA - Handset modification possibly required, additional research needed
  - iDEN - Handset modification probably required to enable solution
  - AMPS, GSM - No Handset modifications required

## Legacy Phone Issue

- **First and second generation RF technologies have different legacy issues**
  - First Generation (Large base, forecasted to decrease)
    - AMPS
  - Second Generation (Small base, forecasted to increase)
    - CDMA
      - Handset modification possibly required for network solution, additional research needed
    - PCS1900 GSM
      - Handset modification may be required based on solution(s) standardized
    - iDEN
      - Handset modification probably required for network solution
- **If any handset modifications are required, the legacy issue will need to be addressed**



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## Industry Activities

- **RMS accuracy under study by WEIAD, October completion target**
- **CDG (E911 Location Technology Group) evaluating location solutions**
- **T1P1 to make Location solution decision for GSM / PCS1900 by end of July '98**
- **IS95B (CDMA)**
  - Power Up Function (PUF) to be optional in CDMA phase I
  - PUF mandatory in IS95B Phase II



## Recommendations

- **Accuracy Compliance**
  - Defer to industry body of public safety, carriers, and manufacturers (i.e. WEIAD) for recommendations
- **Legacy Handsets**
  - Allow flexibility where handset modifications are needed